



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Khalil Najafi, et al.

Group Art Unit:

Examiner:

Serial No.: 10/760,025

Filed: January 16, 2004

For: MICROMACHINED CAPACITIVE LATERAL  
ACCELEROMETER DEVICE AND MONOLITHIC, THREE-  
AXIS ACCELEROMETER HAVING SAME

Attorney Docket No.: UOM 0289 PUSP

**INFORMATION DISCLOSURE STATEMENT**

Commissioner for Patents  
U.S. Patent & Trademark Office  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

In compliance with the duty of disclosure under 37 C.F.R. § 1.56 and § 1.97-1.98, the references listed and identified on the attached Forms PTO/SB08A and/or SB08B are being submitted herewith for consideration by the Examiner.

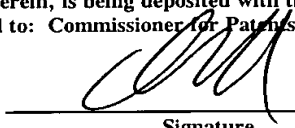
While this Statement is being filed in compliance with the duty of disclosure, citation of the attached references is not to be construed as an admission that any of the reference(s) are "material" as defined under 37 C.F.R. § 1.56(b).

**CERTIFICATE OF MAILING UNDER 37 C.F.R. § 1.8**

I hereby certify that this paper, including all enclosures referred to herein, is being deposited with the United States Postal Service as first-class mail, postage pre-paid, in an envelope addressed to: Commissioner for Patents, U.S. Patent & Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450 on:

February 11, 2004  
Date of Deposit


David R. Syrowik  
Name of Person Signing

  
Signature

If the filing date of this application is on or before June 30, 2003, a copy of each reference listed on the attached Forms PTO/SB08A and/or SB08B is included herewith. If this application was filed after June 30, 2003, copies of any cited U.S. patent/application references have not been included. Consideration and entry into the record of these references is respectfully requested.

Respectfully submitted,

**Khalil Najafi, et al.**

By:   
David R. Syrowik  
Reg. No. 27,956  
Attorney/Agent for Applicant

Date: February 11, 2004

**BROOKS KUSHMAN P.C.**  
1000 Town Center, 22nd Floor  
Southfield, MI 48075-1238  
Phone: 248-358-4400  
Fax: 248-358-3351

Under the Paperwork Reduction Act of 1996, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

SUBSTITUTE FOR FORM 1449A/P10 <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  <i>(use as many sheets as necessary)</i>				<b>Complete if Known</b>	
				Application Number	10/760,025
				Filing Date	January 16, 2004
				First Named Inventor	Khalil Najafi, et al.
				Group Art Unit	
				Examiner Name	
Sheet	1	of	4	Attorney Docket Number	UOM 0289 PUSP

## U.S. PATENT DOCUMENTS

[illegible]

## FOREIGN PATENT DOCUMENTS

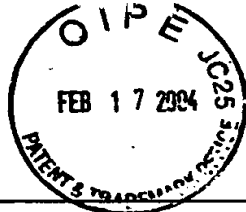
[illegible]

Examiner Signature	Date Considered
-----------------------	--------------------

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Unique citation designation number. <sup>2</sup> See attached Kinds of U.S. Patent Documents. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.

<sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.



<b>Substitute for Form 1449B/PTO</b>  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (use as many sheets as necessary)				<b>Complete if Known</b>	
				Application Number	10/760,025
				Filing Date	January 16, 2004
				First Named Inventor	Khalil Najafi, et al.
				Group Art Unit	
				Examiner Name	
Sheet	2	of	4	Attorney Docket Number	UOM 0289 PUSP

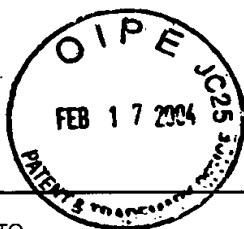
### OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
		YAZDI, NAVID, ET AL., Micromachined Inertial Sensors, Proceedings of the IEEE, Vol. 86, No. 8, August 1998, pps. 1640-1659	
		YAZDI, NAVID, Micro-g Silicon Accelerometers with High Performance CMOS Interface Circuitry, EECS, 1999, The University of Michigan, Ann Arbor, Michigan	
		Analog-Devices, ADXL50, Monolithic Accelerometer with Signal Conditioning, Data Sheet, 1996, pps. 1-15	
		Analog Devices, ADXL105, High Accuracy +-1g to +-5g Single Axis Imems Accelerometer with Analog Input, 1999, pps. 1-8	
		LU, C., ET AL., A Monolithic Surface Micromachined Accelerometer with Digital Output, IEEE Journal of Solid-State Circuits, Vol. 30, No. 12, December 1995, pps. 1367-1373	
		BOSER, BERNHARD E., ET AL., Surface Micromachined Accelerometers, IEEE Journal of Solid-State Circuits, Vol. 31, No. 3, March 3, 1996, pps. 366-375	
		CROSS-BOW, High Sensitivity Accelerometer, LF Series Data Sheet, San Jose, California, 2001	
		LUO, HAO, ET AL., A 1 mG Lateral CMOS-MEMS Accelerometer, 13 <sup>th</sup> IEEE International Conference on Micro Electro Mechanical Systems, MEMS 2000, Miyazaki, Japan	
		WU, JIANGFENG, ET AL., A Low-Noise Low-Offset Chopper-Stabilized Capacitive-Readout Amplifier for CMOS MEMS Accelerometers, IEEE International Solid State Circuits Conference ISSCC 2002, San Francisco, California	
		LEMKIN, M., ET AL., A Low-Noise Digital Accelerometer Using Integrated SOI-MEMS Technology, 10 <sup>th</sup> International Conference Solid-State Sensors And Actuators, Transducers 1999, Sendai, Japan	
		ISHIHARA, KEI, ET AL., An Inertial Sensor Technology Using DRIE and Wafer Bonding with Interconnecting Capability, Journal of Microelectromechanical Systems, Vol. 8, No. 4, December 1999, pps. 403-408	

Examiner Signature		Date Considered	
-----------------------	--	--------------------	--

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup>Unique citation designation number. <sup>2</sup>Applicant is to place a check mark here if English language Translation is attached.



<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (use as many sheets as necessary)				<b>Complete if Known</b>	
				Application Number	10/760,025
				Filing Date	January 16, 2004
				First Named Inventor	Khalil Najafi, et al.
				Group Art Unit	
Sheet	3	of	4	Examiner Name	
				Attorney Docket Number	UOM 0289 PUSP

### OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
		GRIFFIN, W.S., ET AL., A Study of Fluid Squeeze-Film Damping, ASME Journal of Basic Engineering, June 1996, pps. 451-456	
		ZHANG, XIA, ET AL., Viscous Air Damping In Laterally Driven Microresonators, Proceedings of The IEEE Micro Electro Mechanical Systems, 1994, pps. 199-204	
		HENRION, WIDGE, ET AL., Wide Dynamic Range Direct Digital Accelerometer, Wide Dynamic Range Direct Digital Accelerometer, Solid State Sensors and Actuators Workshop, Hilton Head Island, SC, 1990	
		YAZDI, NAVID, ET AL., All-Silicon Single-Wafer Micro-g Accelerometer with a Combined Surface and Bulk Micromachining Process, Journal of Microelectromechanical Systems, Vol. 9, No. 4, December 4, 2000, pps. 544-550	
		RUDOLF, F., ET AL., Precision Accelerometers with ug Resolution, Sensor and Actuators, A21-A23, 1990, pps. 297-302	
		MAXWELL, PETER ET AL., Design Through to Production of a MEMS digital Accelerometer for Seismic Acquisition, First Break, Vol. 19, March 3, 2001	
		XIAO, ZHIXIONG, ET AL., Laterally Capacity Sensed Accelerometer Fabricated with the Anodic Bonding and the High Aspect Ratio Etching, 10 <sup>th</sup> International Conference Solid-State Sensors and Actuators, Transducers 1999, Sendai, Japan	
		CHAE, JUNSEOK, ET AL., A Hybrid Silicon-On-Glass (SOG) Lateral Micro-Accelerometer With CMOS Readout Circuitry, 15 <sup>th</sup> IEEE International Conference on Micro Electro Mechanical Systems, MEMS 2002, Las Vegas, Nevada,	
		YAZDI, NAVID, ET AL., An All-Silicon Single-Wafer Fabrication Technology For Precision Microaccelerometers, 9 <sup>th</sup> International Conference Solid-State Sensors and Actuators, Transducers 1997, Chicago, IL, pps. 1181-1184	
		DOSCHER, JAMES, ADXL105: a Lower Noise, Wider Bandwidth Accelerometer Rivals Performance of More Expensive Sensors, 1999 Analog Dialogue 33-6, 1999 Analog Devices	

Examiner Signature		Date Considered	
-----------------------	--	--------------------	--

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup>Unique citation designation number. <sup>2</sup>Applicant is to place a check mark here if English language Translation is attached.



Substitute for Form 1449B/PTO

# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

## Complete if Known

Application Number	10/760,025
Filing Date	January 16, 2004
First Named Inventor	Khalil Najafi, et al.
Group Art Unit	
Examiner Name	
Attorney Docket Number	UOM 0289 PUSP

Sheet 4 of 4

## OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
		HONEYWELL, ASA7000, Micromachined Accelerometer, Data Sheet, July 2001	
		MOTOROLA, MMA2201D, Surface Mount Micromachined Accelerometer, Data Sheet 2000, pps. 1-8	
		ROYLANCE, L.M., ET AL., A Batch Fabricated Silicon Accelerometer, IEEE Trans Electron Devices, Vol. ED-26, No. 12, December 1979, pps. 1911-1917	
		SALIAN, A., ET AL., A High-Performance Hybrid CMOS Microaccelerometer, Solid-State Sensors and Actuators Workshop, Hilton Head Island, SC, June 4-8, 2000, pps. 285-288	
		ROARK, R.J., ET AL., Roark's Formulas for Stress and Strain, 6 <sup>th</sup> Ed. 1989, New York: McGraw-Hill, xiv, Vol. 763	
		WARREN, KEITH, Navigation Grade Silicon Accelerometers with Sarificially Etched SIMOX and BESOI Structure, Solid-State Sensors and Actuators Workshop, June 13-16, 1994 Hilton Head Island, SC, pps. 69-72	
		ENDEVCO, Variable Capacitance Accelerometer, Model 7596, Data Sheet, 2000	
		CHAE, JUNSEOK, ET AL., A Monolithic Three-Axis Silicon Capacitive Accelerometer With Micro-G Resolution, 12 <sup>th</sup> IEEE International Conference on Solid-State Sensors, Actuators and Microsystems, Transducers 2003, Boston, MA	

Examiner Signature		Date Considered	
-----------------------	--	--------------------	--

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup>Unique citation designation number. <sup>2</sup>Applicant is to place a check mark here if English language Translation is attached.